



## FUTURE ANXIETY UNDER COVID-19 CIRCUMSTANCES: TESTING THE EFFECT OF GRATITUDE AND MEDIATING ROLE OF THREAT PERCEPTION\*

COVID-19 KOŞULLARINDA GELECEK KAYGISI: MİNNETTARLIĞIN ETKİSİ VE TEHDİT ALGISININ ARACI ROLÜNÜN TEST EDİLMESİ

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### Abstract

The Covid-19 outbreak increased the importance of dispositional qualities and easy-to-use self-help strategies to promote mental well-being. Previous research indicate that disposition to gratitude enhances well-being by protecting mental health. However, evidence for the efficacy of gratitude-inducing interventions in preventing psychological problems is mixed. Further, data on the gratitude-well-being link under Covid-19 circumstances are inconclusive. In the present research, we examined the role of trait gratitude and gratitude-listing intervention in alleviating future anxiety during the pandemic, and the mediating role of perceived realistic and symbolic threats from Covid-19. In the first study, a correlational study (N = 405), participants rated the predictor and outcome measures—the scales of gratitude, future anxiety, and perceived realistic and symbolic threats from Covid-19. In the second study, a pretest-posttest intervention study (N = 150), participants were randomly assigned to three conditions: to list grateful experiences or important daily life events every two days for a month, or to complete only the pretest and posttest measures. Results indicated that disposition to gratitude was associated with lower future anxiety (study-1), whereas the gratitude-listing intervention did not reduce this anxiety (study-2). Furthermore, in both studies, the perceived Covid-19 threats did not mediate the relationship between gratitude and future anxiety. Exploratory qualitative analyses of participants' gratitude lists and feedback in the second study showed that the pandemic situation hindered the benefits of the intervention. Overall, the results suggest that trait gratitude is more strongly associated with alleviation of psychological distress during the Covid-19 pandemic than gratitude listing. This supports the accumulating data that gratitude interventions, while beneficial for well-being, have limited effectiveness in reducing symptoms of ill-being, such as anxiety.

### Öz

Covid-19 salgını, zihinsel sağlığı desteklemek için kişilik özelliklerinin ve uygulanması kolay kendi kendine yardım stratejilerinin önemini artırdı. Önceki araştırmalar, bir kişilik özelliği olarak minnettariik eğiliminin psikolojik sağlığı koruyarak iyi oluşu artırdığını göstermektedir. Buna karşın, minnettariikli artıncı müdahalelerin psikolojik sorunları önleme etkinliğine ilişkin bulgular tutarsızdır. Ayrıca, Covid-19 koşulları altında minnettariik-iyi oluş bağlantısını araştıran çalışmaların verileri de çelişkili sonuçlara işaret etmektedir. Mevcut araştırmada, pandemi sırasında gelecek kaygısını hafifletmede bir kişilik özelliği olarak minnettariik eğiliminin ve minnettariik listeleme müdahalesinin etkisini inceledik. Ek olarak, gerçekçi ve sembolik tehdit algılarının minnettariik-gelecek kaygısı ilişkisindeki aracı rolünü araştırdık. Korelasyonel bir desende yürütülen ilk çalışmada (N = 405), katılımcılar minnettariik, gelecek kaygısı ve Covid-19 gerçekçi ve sembolik tehdit ölçeklerini yanıtlamıştır. Öntest-sontest desenli bir müdahale çalışması olan ikinci çalışmada ise (N = 150) katılımcılar bir ay boyunca her iki günde bir minnettariik deneyimlerini veya önemli günlük yaşam olaylarını listelemek ya da sadece öntest ve sontest ölçümlerini tamamlamak üzere üç ayrı koşula seçkisiz olarak atanmıştır. Bulgular, minnettariik eğiliminin gelecek kaygısını negatif yönde yordadığını (çalışma-1), minnettariik listeleme müdahalesinin ise bu kaygıyı azaltmadığını ortaya koymuştur (çalışma-2). Ayrıca, algılanan Covid-19 tehditleri her iki çalışmada da minnettariik ve gelecek kaygısı arasındaki ilişkiye aracılık edememiştir. Minnettariik listeleri ve katılımcıların sontest geribildirimleri üzerinde yapılan açılımlayıcı nitel analizler, salgın koşullarının minnettariik müdahalesinin faydalarını engellediğini göstermiştir. Genel olarak bulgular, Covid-19 salgını koşullarında, minnettariik listeleme müdahalesine oranla minnettariik eğiliminin psikolojik sıkıntıları hafifletmede daha etkili olduğuna işaret etmektedir. Bu bulgular ayrıca minnettariik müdahalelerinin iyi oluş için faydalı olmakla birlikte, anksiyete gibi psikopatoloji belirtilerini azaltmada sınırlı etkinliğe sahip olduğuna dair giderek artmakta olan verileri de desteklemektedir.

\* Ethical Declaration: The studies reported in this manuscript were approved by the ethics committee of Ankara University (Approval date: 09.06.2020. Approval number: 0616). Informed consent was obtained from all participants before participation in the studies.

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## Introduction

The Covid-19 pandemic adversely affected the psychological well-being of the public. Numerous studies reported an increase in mental health problems such as fear, anxiety, stress, and depression after the outbreak of the virus (Dragioti et al, 2022; Xiong et al., 2020; Vindegaard & Benros, 2020). This, in turn, led to an increased need for psychological support. However, pandemic containment measures such as social isolation and lockdowns made in-person therapy almost impossible.

There is a need for affordable, easy-to-use, and evidence-based strategies to help people improve their psychological well-being in such crisis situations. One of the strategies that fits this description is the gratitude intervention. It has been suggested that gratitude interventions, such as gratitude listing—i.e., listing things for which one is grateful for, can be used as therapeutic tools to enhance mental well-being (e.g., Emmons & Stern, 2013). Despite evidence for the usefulness of gratitude interventions in promoting well-being (Emmons & Mishra, 2011), there are also data showing that the effectiveness of these interventions in protecting against mental health problems is weak (Jans-Beken et al., 2020). The data on the benefits of gratitude interventions during Covid-19 are also equivocal (e.g., Datu et al., 2021; Dennis & Ogden, 2022; Kloos et al., 2022).

The primary aim of this research was, therefore, to test the benefits of the gratitude listing during the Covid-19 outbreak. Specifically, we tested the effectiveness of this technique in reducing future anxiety (Zaleski, 1996) and perceived realistic and symbolic threats from Covid-19 (Kachanoff et al., 2020), all of which were intensely felt during the pandemic (Duplaga & Grysztar, 2021; Kachanoff et al., 2020; Liu et al., 2021; Paredes et al., 2021). Second, we compared the association of gratitude listing and disposition to gratitude (i.e., trait gratitude) with these outcomes, as they have been shown to be differentially related to the protection against psychological problems (Jans-Beken et al., 2020). Finally, we investigated the mediating role of perceived realistic and symbolic threats from Covid-19 to explore a possible mechanism linking gratitude and future anxiety, following the calls to explore mediators between gratitude and well-being (e.g., Wood et al., 2010). In doing so, we attempted to test and extend previous findings under Covid-19 conditions.

## **Gratitude**

Gratitude is the tendency to recognize and appreciate the positive in life, and to regard life events from a positive perspective (Wood et al., 2010). The sources of our gratitude can be other people, other beings such as God and the universe, and simple positive things in life like waking up happy in the morning (Emmons & Crumpler, 2000; McCullough et al., 2002; Wood et al., 2010). It has been conceptualized both as a trait or personal characteristic (i.e., disposition to gratitude) and as a situational characteristic that emerges because of external influence (i.e., state gratitude) (Wood et al., 2010). Disposition to gratitude refers to the tendency to recognize and appreciate the positive aspects of the world, whereas state gratitude is a temporary state of awareness or experience of gratitude because of external interventions, such as through gratitude listing (Jans-Beken et al., 2020).

Because of its positive link with life, it is argued that the feeling of gratitude makes individuals think and act in a more positive manner by broadening their mental focus towards the positive (Fredrickson, 2004; McCullough et al., 2001). Consistent with this, research indicate that gratitude promotes happiness, life satisfaction, and positive affect while enabling protection against stress, depression, and negative affect (Bono & Sender, 2018; Dickens, 2017). Importantly, increasing gratitude externally through gratitude interventions also helps individuals develop a positive perspective on life events, thereby enhancing well-being (Emmons & McCullough, 2003; Lyubomirsky et al., 2011; Seligman et al., 2005). However, while disposition to gratitude is consistently positively associated with improved well-being, the efficacy of gratitude interventions in protecting against mental health problems appears to be weak (Jans-Beken et al., 2020), making it important to examine their role during the Covid-19 pandemic.

## **Future Anxiety**

Future anxiety refers to the expectation that unfavorable changes may occur in the future and the subsequent state of uncertainty, fear, and worry (Zaleski, 1996). It can be described as the future-specific form of generalized anxiety (Zaleski et al., 2019). One source of this anxiety is the fear of adverse changes beyond one's control, such as the spread of infectious diseases (Zaleski, 1996). In support of this, high levels of future anxiety (Duplaga & Grysztar, 2021; Paredes et al., 2021) and general anxiety (Fruehwirth et al., 2021) were reported during Covid-19 pandemic. Moreover, future anxiety is positively related to perceived threats from Covid-19 and

pessimism toward the future, but negatively related to resilience and subjective well-being (Parades et al., 2021; Zaleski, 1996; Zaleski et al., 2019). Therefore, it can be argued that the fears and uncertainties about the Covid-19 pandemic exacerbated future anxiety and added it to major problems that people faced during this period. Therefore at this point in time, it is important to explore the role of mitigating factors, such as gratitude.

### **Gratitude and Future Anxiety**

To our knowledge, no previous study has directly examined the relationship between gratitude and future anxiety. On the other hand, although gratitude interventions aimed at reducing anxiety do not show encouraging results (Cregg and Cheavens, 2020; Davis et al., 2016; Dickens, 2017), disposition to gratitude predicts decrease in anxiety (Jans-Beken et al., 2020). Moreover, because disposition to gratitude reduces future-related anxiety, such as the fear of death (Lau & Cheng, 2011; Otto et al., 2016), one would expect it to reduce future anxiety as well. Therefore, we predicted that gratitude would be negatively associated with future anxiety and that the association of dispositional gratitude would be stronger than that of gratitude listing.

### **The Mediating Role of Covid-19 Threats**

Several researchers have called for investigating mechanisms mediating the relationship between gratitude and well-being (e.g., Emmons & Mishra 2011; Wood et al., 2010). Jans-Beken et al. (2020) argue that these mechanisms may play a key role in understanding the mixed findings concerning the relationship between gratitude and mental well-being. Among the candidates are the perceived realistic and symbolic threats (Stephan & Stephan, 2000) that stem from Covid-19. Realistic Covid-19 threats are threats to our health and welfare, such as the fear of contracting the virus and unemployment due to Covid-19. Symbolic Covid-19 threats are threats to social norms and values such as the inability to perform social routines like meeting in person with friends and collectively participating in social events due to the Covid-19 restrictions (Kachanoff et al., 2020).

Kachanoff et al. (2020) reported high levels of perceived realistic and symbolic threats from Covid-19 and found that these threats are associated with a decrease in well-being and an increase in stress and anxiety. Likewise, threat perceptions from various consequences of Covid-19 have been shown to predict an increase in future anxiety (Duplaga & Grysztar, 2021; Parades et al., 2021) and psychological

distress (Liu et al., 2021). Moreover, Zaleski (1996) hypothesizes that uncontrollable global crises can lead people to view the future with negative attitudes such as fear, threat, and hopelessness, and that the severity of future anxiety depends on the intensity of this negativity. This hypothesis suggests that the symbolic and realistic threats of Covid-19 can intensify future anxiety. However, gratitude—because of its potential to divert individuals' mental focus from the negative to the positive in life—should alleviate these threat perceptions, a decrease in them in turn would reduce future anxiety.

### **The Present Research**

During the severe waves of the Covid-19 outbreak in 2020, a critical question was how or by what means people could protect their mental well-being as uncertainties and fears about the future were mounting and face-to-face therapeutic support was severely limited due to pandemic containment measures. The current research was designed to test the usefulness of the gratitude listing technique, an affordable and easy-to-use coping technique offered as a self-administered therapeutic tool (Emmons & Stern, 2013), in buffering against psychological distress and to compare its effectiveness with disposition to gratitude. Specifically, through two studies, we examined the association between gratitude and future anxiety along with the mediating role of perceived realistic and symbolic threats from Covid-19. In the first study, using a correlational design, we predicted that disposition to gratitude would be associated with reduced perception of these threats and the decrease in them would be associated with a decrease in future anxiety. In the second study, using an experimental design, our aim was twofold. First, we examined the effect of gratitude listing on reduction of future anxiety and the threat perceptions. Second, we tested the same mediation model in the first study with gratitude intervention as the independent variable, hypothesizing that the participants in the gratitude listing condition would perceive less threats from Covid-19 than those in the control conditions, which in turn would lead them to feel less future anxiety.

## STUDY 1

### Method

#### Participants

We performed a Monte Carlo power analysis for indirect effects using Schoemann et al.'s (2017) application (URL-1) with power set at .80 and  $\alpha = .05$ . Analyses, with small to medium inter-variable correlations suggested around 300 participants as the minimum sample size. A convenience sample of 545 Turkish adults participated in the study, 140 of which (26%) were excluded from the analyses (95 completed less than 50% of the questionnaire or did not respond to the dependent variable, 40 completed the questionnaire in less than five minutes or more than 60 minutes, three were under 18 years of age, and three were outliers). All analyses were performed with the remaining 405 participants aged 18 to 66 ( $M = 36.51$ ,  $SD = 12.04$ , two didn't report age; 59.80% female, 39.50% male, 0.70% other). Among the participants, the majority reported an undergraduate student status or undergraduate degree as their educational level (high school or less: 11.30%; undergraduate student or degree: 62.50%; graduate student or degree: 26.20%), and nearly half identified their socioeconomic status as medium (low: 18.30%; medium: 45.90%; high: 35.80%). Five participants (1.20%) indicated they contracted the coronavirus, whereas 27 (6.70%) indicated a member of their family contracted the virus. Finally, 13 participants (3.20%) reported they lost their jobs due to Covid-19, while 87 (21.50%) reported they were also unemployed before the outbreak.

#### Measures

##### Trait Gratitude

We used McCullough et al.'s (2002) Gratitude Questionnaire (GQ-6) previously adapted to Turkish by Yüksel & Oğuz-Duran (2012). It consists of six items measuring the disposition to be grateful to life (e.g., "I have so much in life to be thankful for"). Participants rated the items on a five-point scale (1 = "strongly disagree"; 5 = "strongly agree"). Higher scores reflect higher gratitude disposition. In the current study, after removal of the item, "long amounts of time can go by before I feel grateful to something or someone", which had a very low item-total correlation ( $r = .13$ ), the reliability of the scale (McDonald's  $\omega$ ) was .79<sup>1</sup>.

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<sup>1</sup> We used McDonald's Omega because of the recommendations to abandon Cronbach's Alpha and to use McDonald's Omega instead. (e.g., Hayes & Coutts, 2020; McNeish, 2018; Peters, 2014).

### **Covid-19 Realistic and Symbolic Threats**

We adapted the 10 item Integrated Covid-19 Threat Scale of Kachanoff et al. (2020) into the Turkish context. Five of the items assess the perceived realistic threats from Covid-19 to personal or collective health and welfare in Turkey (e.g., “Covid-19 is a threat to the Turkish economy”). The other five items assess the perceived symbolic threats from Covid-19 to sociocultural values and norms in Turkey (e.g., “Covid-19 is a threat to Turkish values”). In the original study, the internal consistency of the scales (Cronbach’s alpha) ranges from .85 to .86 for symbolic threat, and from .73 to .77 for realistic threat. In the present study, a principal axis factoring method performed using varimax rotation replicated the two-factor structure in the original study. Symbolic threat items loaded on one factor (factor loadings from .57 to .83;  $\omega = .84$ ), and realistic threat items loaded on another (factor loadings from .45 to .80;  $\omega = .79$ ). Participants rated the degree of threat they perceived from each of the items from 1 (“no threat at all”) to 5 (“extreme threat”). High scores indicate high threat perception.

### **Future Anxiety**

We adapted Zaleski’s (1996) Future Anxiety Scale in Turkish, which consists of 29 items designed to measure the tendency to think of the future with uncertainty, fear, and anxiety along with the anticipation that uncontrollable adverse changes will occur in the future (e.g., “I fear I will fail to overcome mounting difficulties”). Four buffer items expressing positivity toward the future are not included in the scoring. In the present study, replicating the original study, a principal axis factoring analysis revealed a single-factor structure (factor loadings from .51 to .82;  $\omega = .95$ ), after removing the item, “I am not afraid that in the future people will be ‘wolves’ to each other”, which had a very low item-total correlation ( $r = .04$ ). Participants rated the items from 1 (“strongly disagree”) to 5 (“strongly agree”). Higher scores reflect higher future anxiety.

### **Demographic Form**

Participants reported their age, gender, level of education, socioeconomic status, employment status, whether they or a family member had been infected with the coronavirus, and whether they had lost a family member to the virus.

## Procedure

The study was approved by the ethics committee of Ankara University (approval date and number: 09.06.2020 - 06/16). We collected the data online in the summer of 2020 when the pandemic was at one of its peaks. We reached the participants through announcements on social media and in e-mail groups. All participants gave informed consent before proceeding with the scales. The questionnaire takes about 10 minutes to complete.

## Results

### Relationships among the Variables

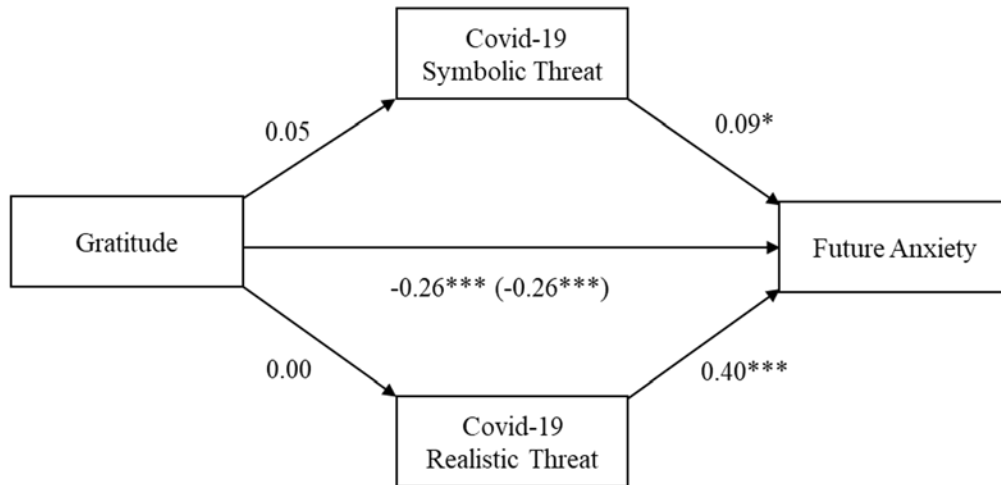
As expected, there was a significant negative relationship between gratitude and future anxiety ( $r = -.23, p < .001$ ). Likewise, there was a significant positive relationship between future anxiety and the Covid-19 threats (realistic,  $r = .36, p < .001$ ; symbolic,  $r = .23, p < .001$ ). However, the relationships of gratitude with the Covid-19 threats were not significant (realistic,  $r = .02, p = .625$ ; symbolic,  $r = .09, p = .064$ ). (See Appendix 1, Table A1 for the descriptives and other correlations).

### Mediation Analysis

We performed a mediation analysis using the PROCESS macro for the IBM SPSS with 5,000 bootstrap samples (Hayes, 2018) to test our prediction that perceived realistic and symbolic threats of Covid-19 mediate the association between gratitude and future anxiety. Gender, employment status (employed-unemployed), and Covid-19 infection status (oneself or a family member infected-not infected) were dummy coded and included in the equation as covariates to control any confounding effects. Gender was included in this list based on the research indicating gender-based differences in gratitude and its consequences (Froh et al., 2009; Kashdan et al., 2009).

As is seen in Figure 1, gratitude negatively and significantly predicted future anxiety, as expected (total effect,  $b = -0.26, SE = 0.05, 95\% CI [-0.35, -0.17]$ ). When the effects of the perceived realistic and symbolic threats from Covid-19 were controlled, the effect of gratitude on future anxiety remained the same (direct effect,  $b = -0.26, SE = 0.05, 95\% CI [-0.36, -0.16]$ ). Consistent with this, the indirect effects of gratitude via perceived realistic ( $b = 0.00, SE = 0.02, 95\% CI [-0.03, 0.03]$ ) and symbolic ( $b = 0.01, SE = 0.01, 95\% CI [-0.01, 0.02]$ ) threats of Covid-19 were not significant.





**Fig. 1** Summary of the results of the model predicting the effects of trait gratitude on future anxiety via perceived realistic and symbolic threats of Covid-19.

*Note.* The coefficients are unstandardized. The total effect is reported in the parenthesis. Model  $R^2 = .22$ ,  $F(6,398) = 18.86$ ,  $p < .001$ .

\*  $p < .05$ , \*\*\*  $p < .001$ .

## Discussion

The results did not support our primary hypothesis that disposition to gratitude predicts future anxiety via the perceived realistic and symbolic threats of Covid-19. Gratitude was only directly associated with lower future anxiety. The prediction of lower future anxiety by gratitude in this study is consistent with previous evidence indicating gratitude functions as a buffer against fear and anxiety related problems (Bono & Sender, 2018; Wood et al., 2010), including future related anxieties such as the fear of death (Lau & Cheng, 2011, 2013; Otto et al., 2016). This finding, extending previous research, suggests that disposition to gratitude promotes well-being by alleviating concerns and uncertainties about the future under Covid-19 circumstances. Moreover, the significant positive relations between perceived threats from Covid-19 and future anxiety are in agreement with previous findings showing that these threats are associated with higher future anxiety (Duplaga & Gryzstar, 2021; Parades et al., 2021).

The nonsignificant indirect effects via realistic and symbolic threats seem to be a result of the weak correlations between gratitude and these threats. It is interesting to note that disposition to gratitude had very weak correlations with these threats, which were strongly perceived by our participants. One potential explanation may lie in the fact that we collected the data in the summer of 2020 when the pandemic was at one of its peaks. Thus, the participants may have viewed

the threats on the Integrated Covid-19 Threat Scale as real rather than perceived threats. This may have led them into a state of despair, thinking that these threats were ongoing realities beyond their control and would continue to exist regardless of their personal strengths, such as their disposition to gratitude. Since the link between gratitude and these threats has not been tested before, it is hard to go beyond speculations like these. It is worth to note that the prediction of future anxiety by the perceived Covid threats does not contradict with these explanations, as one can feel anxious in the face of uncontrollable real threats just like in the face of perceived threats (Epstein, 1972).

## **STUDY 2**

In this experimental study, we tested the effect of gratitude listing intervention on the reduction of future anxiety and the perceived realistic and symbolic threats from Covid-19. We also examined the same mediation model in the first study with the intervention as the independent variable, testing the hypothesis that participants in the gratitude condition would perceive less threats from Covid-19 than those in the active and passive control groups, which in turn would lead them to feel less future anxiety.

### **Method**

#### **Participants**

The experimental design in this study involves three between-subjects conditions. We aimed to detect a medium effect size (i.e., Cohen's  $f = .25$ ) based on the previous findings (Davis et al, 2016; Emmons & McCullough, 2003). A power analysis using the G\*Power software (Faul et al., 2007) resulted in 53 participants per condition ( $N = 159$ ) for detection of an effect size of this magnitude, with power set at .80 and  $\alpha = .05$ . We increased the targeted number of participants per condition by seven ( $N= 180$ ) to compensate for potential attrition within the limits of our research budget. One hundred and eighty Turkish undergraduate students from Ankara University participated in the study, of which 154 completed the study. Of these, four were excluded for failing to follow instructions, leaving a sample of 150 (aged 18 to 38,  $M = 20.66$ ,  $SD = 2.55$ ; 77.3% female; all of them undergraduate students). About two thirds of them self-reported their socioeconomic status as medium (low = 24%; medium = 63.3%; high 12.7%). Sixteen participants (10.7%) stated they had infected with the coronavirus, 67 (44.7%) stated a member of their family had infected with the virus.

## **Design and Procedure**

The study was approved by the ethics committee of Ankara University (approval date and number: 09.06.2020 - 06/16). All participants gave informed consent before taking part in the study. The study was a pretest-posttest design with three groups (gratitude listing, daily life events listing, control). The daily life events condition was added to the design to control for the mere effect of writing down something irrelevant to gratitude experiences.

The participants were pretested in the first stage of the study. They provided demographic information and completed dependent variables (i.e., grateful emotions, future anxiety, and threat scales). Then, they were randomly assigned to one of the three conditions and informed about the next stages of the study. Participants in the gratitude condition were told that, every two days for a month (15 times in total), a form would be sent to their e-mails asking them to list five things they feel grateful for that had occurred in the past two days. For the daily life events condition, the task of listing gratitude-inducing experiences was replaced with the task of listing important daily life events. Participants in both conditions were also informed that they will be sent a questionnaire similar to that in the pretest at the end of the study. In the control condition, participants only learned that they would be asked to complete a similar questionnaire one month later. Moreover, all participants were told that they would be given \$5 worth money in local currency as a gift after completion of the study. Those who agreed to participate were asked to provide an e-mail address so that they could be contacted.

The second stage of the study began about a week after the first stage. The online forms, with instructions similar to those of Emmons & McCullough (2003) (see Appendix 2), were sent to participants via their e-mail every two days at 17:00 for one month. They were asked to write down their gratitude-inducing or important daily life experiences before they went to bed, at an hour when they were not sleepy. To increase compliance and minimize between-subject differences in task fulfillment, they were informed in the first e-mail that completing the tasks on a regular and timely basis was critical to the purpose of the study.

The posttest was administered two days after the completion of the intervention. All participants first responded to the dependent variables and the demographic questions. They then answered an open-ended question designed to measure whether they had guessed our hypotheses. Participants in the gratitude and daily life events conditions also responded to the following two open-ended

questions designed to provide additional information about the effect of the intervention: 1) “What did you think or how did you feel about the listing tasks assigned to you? For example, how did you feel about writing? Were there any aspects of it that you liked or disliked? If so, what were they?” 2) “Do you think that there has been a change in your perspective on life or events between the first day you started filling in the forms and today?” If so, do you think that this change was positive or negative?” Finally, they were debriefed, thanked for their participation, and paid.

### **Dependent Variables**

Participants completed the same Integrated Covid-19 Threat Scale (symbolic threat: pretest  $\omega = .75$ , posttest  $\omega = .77$ ; realistic threat: pretest  $\omega = .72$ , posttest  $\omega = .69$ ) and Future Anxiety Scale (pretest  $\omega = .94$ , posttest  $\omega = .95$ ) used in the first study.

### **Manipulation Check**

Participants responded to three grateful emotions (*grateful, thankful, appreciative*; pretest  $\omega = .75$ , posttest  $\omega = .80$ ) and three fillers (*tired, excited, and angry*) from Emmons & McCullough (2003). Participants indicated the degree to which they feel these emotions on a scale from 1 (“Never”) to 5 (“Always”). Higher scores reflect higher gratitude.

## **Results**

### **Analysis Strategy**

For comparing changes between conditions, we performed an analysis of covariance (ANCOVA) in which the posttest scores were dependent variables, and the pretest scores were covariates. This analysis strategy allowed us to control for baseline differences.

### **Gender-Condition and Infection Status-Condition Interactions**

We ran an ANCOVA to test for possible effects of gender and Covid-19 infection status (infected versus not infected with the virus). The results showed that neither the gender-condition interaction nor the infection status-condition interaction were significant for any of the dependent variables (all  $ps \geq .066$ ). Therefore, we collapsed across gender and infection status for all subsequent analyses.

### Manipulation Checks

The ANCOVA results revealed a significant difference in the extent to which participants felt the grateful emotions,  $F(2, 146) = 3.88, p = .023, \eta_p^2 = .05$  (Table 1). Bonferroni Post-hoc tests showed that the only significant difference was between the gratitude and control conditions, in that the participants in the gratitude condition reported higher levels of grateful emotions than those in the control condition ( $p = .024$ ). Moreover, the rate of participants reporting a positive change in response to the open-ended posttest question asking about the direction of change was higher in the gratitude condition than in the daily life events condition (56% versus 36%, respectively) (see last section of Appendix 3).

### The Effect of Gratitude Listing on Future Anxiety and Perceived Covid-19 Threats

Contrary to our prediction that gratitude intervention via listing gratitude-inducing events would reduce future anxiety as well as perceived realistic and symbolic threats of Covid-19, the ANCOVA analyses revealed no significant differences between groups in future anxiety,  $F(2, 146) = 1.04, p = .357, \eta_p^2 = .01$ , perceived realistic threats of Covid-19,  $F(2, 146) = 2.53, p = .083, \eta_p^2 = .03$ , and perceived symbolic threats of Covid-19,  $F(2, 146) = 1.05, p = .352, \eta_p^2 = .01$ . Participants in all conditions reported similar scores on all dependent variables (Table 1).<sup>2</sup>

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<sup>2</sup> Given the unequal number of participants in the conditions, we randomly dropped 24 participants from the control group and repeated the analyses to see if there was a change in the pattern of results. The analyses showed no significant differences between groups on either future anxiety or threat perceptions, all  $F$ s  $\leq 2.68$  and all  $P$ s  $\geq .072$ . Therefore, in order to maintain the statistical power, we used all the participants.

**Table 1***Adjusted Means and Standard Errors of the Variables by Condition*

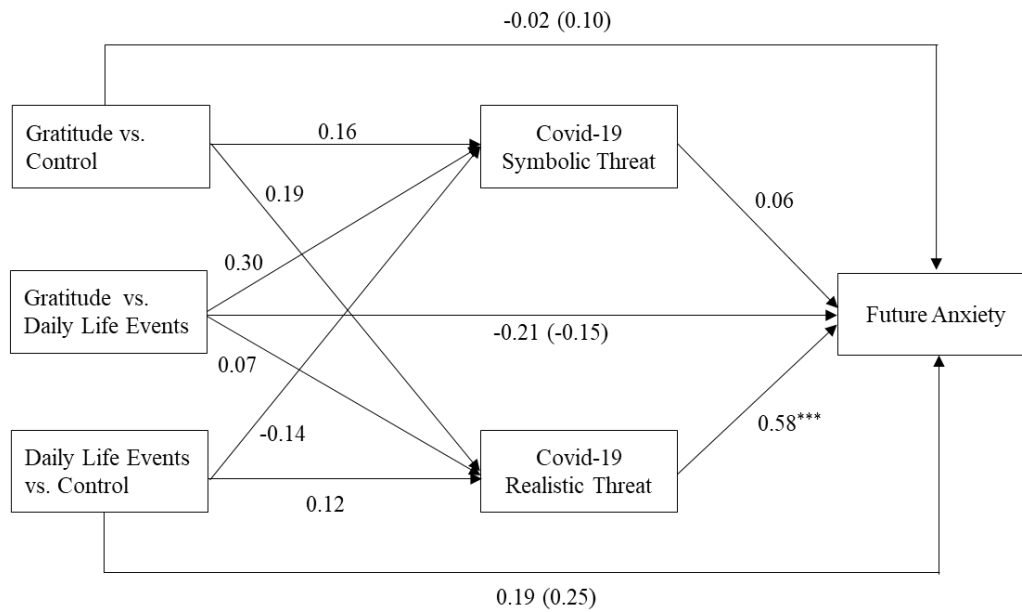
Dependent Variables	Conditions			<i>F</i> (2,146)
	Gratitude (n = 42)	Daily Life Events (n = 42)	Control (n = 66)	
	<i>M</i> ( <i>SE</i> )	<i>M</i> ( <i>SE</i> )	<i>M</i> ( <i>SE</i> )	
Grateful Emotions	3.35 (0.09)	3.09 (0.09)	3.05 (0.07)	3.88*
Realistic Threat	4.53 (0.07)	4.44 (0.07)	4.34 (0.05)	2.53
Symbolic Threat	3.34 (0.10)	3.15 (0.10)	3.18 (0.08)	1.05
Future Anxiety	3.23 (0.07)	3.28 (0.07)	3.16 (0.05)	1.04

*Note.* The reported results are adjusted for the effect of the pretest scores.

\* $p < .05$ .

### **The Mediating Role of Perceived Threats of Covid-19**

As our antecedent variable consisted of three categories (i.e., gratitude, daily life, control conditions), we performed a multicategorical mediation analysis using the PROCESS macro for the SPSS (Hayes, 2018). We utilized the indicator coding system to calculate the relative total, direct, and indirect effects of gratitude condition versus control condition, gratitude condition versus daily life events condition, and daily life events condition versus control condition. We incorporated the dummy coded gender and Covid-19 infection status variables as covariates.



**Fig. 2** Summary results of the model predicting the relative effects of experimental conditions on future anxiety via perceived Covid-19 threats.

*Note.* The coefficients are unstandardized. Values in parentheses represent the relative total effects. Model  $R^2 = .22$ ,  $F(6, 143) = 6.75$ ,  $p < .001$ .

\*\*\*  $p < .001$ .

The analysis revealed that only the indirect effect of being in the gratitude condition relative to being in the control condition on future anxiety through perceived realistic threat of Covid-19 was significant ( $b = .011$ ,  $SE = 0.05$ , 95% CI [0.01, 0.22]), with the direction of the effect being contrary to our prediction (Table 2). None of the remaining effects were significant. More specifically, other than the indirect effect via realistic Covid-19 threat, neither being in the gratitude listing condition relative to being in the control condition nor being in the gratitude listing condition relative to being in the daily life events condition significantly predicted future anxiety, directly or indirectly through the threat perceptions (see Figure 2 and Table 2).

**Table 2***Relative Total, Direct, and Indirect Effects of the Multicategorical Mediation Analyses*

<b>Paths</b>	<b>Effect (b)</b>	<b>Standard Error</b>	<b>95% CI</b>
<b>Relative Total Effects</b>			
Gratitude vs. Control → Future A.	0.10	0.15	[-0.20, 0.40]
Gratitude vs. DLE → Future A.	-0.15	0.17	[-0.48, 0.18]
DLE vs. Control → Future A.	0.25	0.15	[-0.05, 0.55]
<b>Relative Direct Effects</b>			
Gratitude vs. Control → Future A.	-0.02	0.14	[-0.30, 0.26]
Gratitude vs. DLE → Future A.	-0.21	0.15	[-0.52, 0.09]
DLE vs. Control → Future A.	0.19	0.14	[-0.09, 0.46]
<b>Relative Indirect Effects</b>			
Gratitude vs. Control → Symbolic T. → Future	0.01	0.02	[-0.02, 0.06]
Gratitude vs. Control → Realistic T. → Future	0.11	0.05	<b>[0.01, 0.22]</b>
Gratitude vs. DLE → Symbolic T. → Future A.	0.02	0.03	[-0.03, 0.09]
Gratitude vs. DLE → Realistic T. → Future A.	0.04	0.06	[-0.08, 0.16]
DLE vs. Control → Symbolic T. → Future A.	-0.01	0.02	[-0.05, 0.02]
DLE vs. Control → Realistic T. → Future A.	0.07	0.07	[-0.06, 0.21]

*Note.* Gratitude, DLE, and Control refer to gratitude, daily life events, and control conditions, respectively. Symbolic T. = Covid-19 symbolic threat, Realistic T. = Covid-19 realistic threat, Future A. = Future anxiety. The results are based on 5000 bootstrap resamples.

### **Exploratory Qualitative Analyses**

To understand why our gratitude intervention did not produce the expected results, we examined the lists of gratitude experiences participants provided and their responses to the two open-ended questions in the posttest designed to get their feedback about the effects of the intervention (see design & procedure section). Concerning the content of the gratitude experiences, the results suggested that participants might have had a hard time in finding grateful experiences to write about. They generally tended to express their gratitude compared to those who were worse off, or in a way that their current situation could have been worse. Thus, most of the grateful things on their lists can be described as the lesser of two evils.

In response to the question about their thoughts and feelings about the intervention, some of them reported that the pandemic deprived them of many possible experiences for which they might have been grateful or made life less



colorful and more threatening because of the fears it raised, suggesting that they did not derive the desired benefit from the intervention. In the gratitude condition, although the percentage of participants who reported positive change in response to the direction of change question was higher than those who reported negative or no change combined (56% and 44%, respectively), the difference was not substantial, suggesting a modest effect of the intervention. Overall, these results suggest that the challenging pandemic situation may have restricted the benefits of our gratitude intervention, which at least partially explains the unexpected findings (see Appendix 3 for the detailed results of these analyses.)

### **Discussion**

The results did not support our hypothesis that listing gratitude-inducing experiences compared to listing daily life events or listing nothing at all results in significantly less future anxiety and perceived symbolic and realistic threats of Covid-19. These results also contradict the claim that raising gratitude awareness through external interventions promotes well-being by preventing psychological problems (e.g., Emmons & Stern, 2013; Lyubomirsky et al., 2011). But they corroborate the findings showing that the effect of gratitude interventions is limited in reducing symptoms of anxiety, fears, and depression (Cregg & Cheavens, 2020; Dickens, 2017).

Regarding our mediation hypotheses testing the effect of gratitude listing on future anxiety through realistic and symbolic Covid-19 threats, none of our predictions were supported. This is not surprising considering the nonsignificant differences in dependent variables (i.e., future anxiety and the Covid-19 threats) between the gratitude and other conditions, as the relative effects of a multicategorical antecedent are based on the mean differences in dependent variables between the categories (Hayes, 2018). Overall, these findings are similar to those of the first study. In both studies, the Covid-19 realistic and symbolic threats did not significantly mediate the relationship between gratitude and future anxiety.

However, participants' lists of gratitude experiences and their posttest feedback shed some light on the results. Our qualitative results showed that participants' gratitude-inducing experiences were dominated by those of lesser evil and/or boring daily routines, often accompanied by complaints about not being able to live these experiences as fully as before the pandemic. Overall, it seems that there was a limited positivity in our participants' lives during the intervention due to the Covid-19 related challenges such as social isolation, economic difficulties,

and restrictions in mobility. Therefore, the unexpected results in this study may be due, at least partially, to this lack of positivity. This explanation is in line with previous research showing that gratitude interventions tend to promote well-being only when they are accompanied by positive affect or life experiences (Disabato et al., 2017; Lambert et al., 2012). Another explanation may be that our participants were undergraduate students and participated in the study by our invitation rather than out of their need for psychological support. This is compatible with research indicating that college-age participants compared to adults and externally motivated participants compared to internally motivated ones benefit less from self-help gratitude interventions (Dickens, 2017).

### **General Discussion & Conclusion**

Our results across two studies show that disposition to gratitude and gratitude listing are differentially related to future anxiety under Covid-19 circumstances. In the first study, higher trait gratitude was associated with lower future anxiety, supporting previous work indicating that disposition to gratitude is negatively linked with and provides protection against mental health problems, including general (Jans-Beken et al., 2020; Wood et al., 2010) and specific types of anxieties such as the fear of death (Lau & Cheng, 2011; Otto et al., 2016). In the second study, contrary to the literature suggesting that gratitude interventions function as a buffer against psychological problems (e.g., Emmons & Stern, 2013; Lyubomirsky et al., 2011), gratitude listing practices for a month did not reduce future anxiety. However, this result supports a growing body of evidence showing that the effect of gratitude interventions on anxiety reduction is weak (Cregg and Cheavens, 2020; Davis et al., 2016; Dickens, 2017; Jans-Beken et al., 2020).

One reason for the ineffectiveness of our gratitude intervention may be that our participants, due to the stressful Covid-19 situation, struggled to find genuine grateful experiences, which in turn severely impaired the positivity in their lives, a critical condition for gratitude interventions to be effective (e.g., Lambert et al., 2012). The inefficacy of the intervention is also attributable to the characteristics of our sample which consisted of relatively younger individuals with external rather than internal motivation, the two moderators that have been shown to weaken the utility of gratitude interventions (Dickens, 2017).

Regarding our mediation hypotheses, the results in both studies indicated that the perceived realistic and symbolic threats of Covid-19 did not significantly mediate the relationship between gratitude and future anxiety. In both studies, it

seems that the non-significant indirect effects, at least statistically, are due to the weak correlations between gratitude and the perceived realistic and symbolic threats of Covid-19. Since both threats were strongly perceived in both studies, the weak gratitude-threat correlations are not attributable to the possibility that the participants regard these threats as unimportant. One reason may be that we collected the data when the pandemic was at its peak (summer and fall 2020). Therefore, the content of the threat items may have been a reality rather than perceived threats for the participants. This, in turn, may have led them to feel helpless and to believe that the threats were beyond their control and independent of their dispositional characteristics or coping practices.

Overall, our research extended previous literature on the gratitude-well-being association to the Covid-19 pandemic context and to a predominantly Muslim country, Turkey. It shows that disposition to gratitude predicts lower future anxiety, but that listing gratitude experiences does not reduce this anxiety. It also shows that neither of them is associated with perceived realistic and symbolic threats of Covid-19. Our results also confirm the work suggesting that gratitude interventions alone may not be sufficient to improve well-being without eliciting positivity in one's life. Another contribution of this research may be that it extended the literature by employing an unstudied outcome in the gratitude literature, future anxiety, and by testing the mediating role of two unstudied variables, realistic and symbolic threats, in the gratitude-future anxiety relationship. Finally, our findings provide empirical support for the view that caution should be exercised in using gratitude interventions as a substitute for psychotherapy.

### **Limitations and Recommendations**

One limitation of this research is that, in the correlational study, despite all our efforts we couldn't reach a heterogeneous sample in terms of educational level. Over four-fifth of the participants either reported they hold a university degree or were undergraduate students. Therefore, any generalization of the results should be made keeping this limitation in mind. Another limitation is that, in the experimental study, we asked the participants to list five grateful experiences in each session, which turned out to be a demanding task. Our qualitative analyses of participants' feedback and gratitude lists suggest that they had difficulty completing this five-item list, which in turn made them question their accomplishments and happiness, presumably limiting the benefits of the intervention. Therefore, rather than asking participants to write a large or fixed number of grateful experiences, especially in

stressful circumstances, it may be more useful to offer flexibility and allow participants to list as many experiences as they wish. Such a flexibility may increase positive awareness and make the intervention more therapeutic because in this case, participants will only list things they are genuinely grateful for. Working with undergraduates in the experimental study can be considered another limitation, in that they did not participate in the study because they needed such help, but rather because we invited them to do so. This seems to result in lower internal motivation, which has been shown to limit the benefit of gratitude interventions. Therefore, working with individuals who need gratitude practices may provide a better understanding of the true effects of these interventions.

### **Statements and Declarations**

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#### **Ethics Declarations**

The studies reported in this manuscript were approved by the ethics committee of Ankara University (Approval date: 09.06.2020. Approval number: 0616). Informed consent was obtained from all participants before participation in the studies.

#### **Declaration of Competing Interest**

The authors report there are no competing interests to declare

#### **Data availability**

The data are available at the Open Science Framework (URL-2).

### **References**

- Bono, G., & Sander, J. (2018). How gratitude connects humans to the best in themselves and in others. *The Research in Human Development*, 15, 224–237. <https://doi.org/10.1080/15427609.2018.1499350>
- Cregg, D., & Cheavens, J. S. (2020). Gratitude interventions: Effective self-help? A meta-analysis of the impact on symptoms of depression and anxiety. *Journal of Happiness Studies*. <https://doi.org/10.1007/s10902-020-00236-6>

- Datu, J. A. D., Valdez, J. P. M., McInerney, D. M., & Cayubit, R. F. (2022). The effects of gratitude and kindness on life satisfaction, positive emotions, negative emotions, and COVID-19 anxiety: An online pilot experimental study. *Applied Psychology: Health & Well-Being*, 14(2), 347-361. <https://doi.org/10.1111/aphw.12306>
- Davis, D. E., Choe, E., Meyers, J., Wade, N., Varjas, K., Gifford, A., Quinn, A., Hook, J. N., Van Tongeren, D. R., Griffin, B. J., & Worthington, E. L., Jr. (2016). Thankful for the little things: A meta-analysis of gratitude interventions. *Journal of Counseling Psychology*, 63(1), 20-31. <https://doi.org/10.1037/cou0000107>
- Dennis, A., & Ogden, J. (2022). Nostalgia, gratitude, or optimism: The impact of a two-week intervention on well-being during COVID-19. *Journal of Happiness Studies*, 23(6), 2613-2634. <https://doi.org/10.1007/s10902-022-00513-6>
- Dickens, L. R. (2017). Using gratitude to promote positive change: A series of meta-analyses investigating the effectiveness of gratitude interventions. *Basic and Applied Social Psychology*, 39(4), 193-208. <https://doi.org/10.1080/01973533.2017.1323638>
- Disabato, D. J., Kashdan, T. B., Short, J. L., & Jarden, A. (2017). What predicts positive life events that influence the course of depression? A longitudinal examination of gratitude and meaning in life. *Cognitive Therapy and Research*, 41, 444-458. <https://doi.org/10.1007/s10608-016-9785-x>
- Dragioti, E., Li, H., Tsitsas, G., Lee, K. H., Choi, J., Kim, J., ... & Solmi, M. (2022). A large-scale meta-analytic atlas of mental health problems prevalence during the COVID-19 early pandemic. *Journal of medical virology*, 94(5), 1935-1949. <https://doi.org/10.1002/jmv.27549>
- Duplaga, M., & Grysztar, M. (2021). The association between future anxiety, health literacy and the perception of the COVID-19 pandemic: A cross-sectional study. *Healthcare*, 9(1), 43-61. <https://doi.org/10.3390/healthcare9010043>
- Emmons, R. A., & McCullough, M. E. (2003). Counting blessings versus burdens: An empirical investigation of gratitude and subjective wellbeing in daily life. *Journal of Personality and Social Psychology*, 84(2), 377-389. <https://doi.org/10.1037/0022-3514.84.2.377>

- Emmons, R. A., & Crumpler, C. A. (2000). Gratitude as a human strength: Appraising the evidence. *Journal of Social and Clinical Psychology, 19*(1), 56-69. <https://doi.org/10.1521/jscp.2000.19.1.56>
- Emmons, R. A., & Mishra, A. (2011). Why gratitude enhances well-being: what we know, what we need to know. In K. M. Sheldon, T. B. Kashdan & M. F. Steger (Ed.), *Designing Positive Psychology* (pp. 248-262). Oxford University Press.
- Emmons, R. A., & Stern, R. (2013). Gratitude as a psychotherapeutic intervention. *Journal of Clinical Psychology: In Session, 69*(8), 846-855. <https://doi.org/10.1002/jclp.22020>
- Epstein, S. (1972). The nature of anxiety with emphasis upon its relationship to expectancy. In C. D. Spielberger (Ed.), *Anxiety: Current trends in theory and research* (Vol. 2, pp. 291–337). Academic Press.
- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G\*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175–191). <https://doi.org/10.3758/BF03193146>
- Fredrickson, B. L. (2004). Gratitude, like other positive emotions, broadens and builds. In R. A. Emmons & M. E. McCullough (Ed.), *The Psychology of Gratitude* (pp.145-165). Oxford University Press.
- Froh, J.J., Yurkewicz, C., & Kashdan, T.B. (2009). Gratitude and subjective well-being in early adolescence: Examining gender differences. *Journal of Adolescence, 32*, 633–650. <https://doi.org/10.1016/j.adolescence.2008.06.006>
- Fruehwirth J. C., Biswas S., & Perreira, K. M. (2021) The Covid-19 pandemic and mental health of first-year college students: Examining the effect of Covid-19 stressors using longitudinal data. *PloSONE, 16*(3): e0247999. <https://doi.org/10.1371/journal.pone.0247999>
- Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press.
- Hayes, A. F. & Coutts, J. J. (2020) Use Omega Rather than Cronbach's Alpha for Estimating Reliability. But..., *Communication Methods and Measures, 14*:1, 1-24. Doi: 10.1080/19312458.2020.1718629

- Jans-Beken, L., Jacobs, N., Janssens, M., Peeters, S., Reijnders, J., Lechner, L., & Lataster, J. (2020) Gratitude and health: An updated review. *The Journal of Positive Psychology*, 15(6), 743-782. <https://doi.org/10.1080/17439760.2019.1651888>
- Kachanoff, F. J., Bigman, Y. E., Kapsaskis, K., & Gray, K. (2020). Measuring realistic and symbolic threats of Covid-19 and their unique impacts on well-being and adherence to public health behaviors. *Social Psychological and Personality Science*, 12(5), 603-616. <https://doi.org/10.1177/1948550620931634>
- Kashdan, T. B., Mishra, A., Breen, W. E., & Froh, J. J. (2009). Gender differences in gratitude: Examining appraisals, narratives, the willingness to express emotions, and changes in psychological needs. *Journal of Personality*, 77(3), 691-730. <https://doi.org/10.1111/j.1467-6494.2009.00562.x>
- Kloos, N., Austin, J., van 't Klooster, J. W., Drossaert, C., & Bohlmeijer, E. (2022). Appreciating the Good Things in Life During the Covid-19 Pandemic: A Randomized Controlled Trial and Evaluation of a Gratitude App. *Journal of happiness studies*, 23(8), 4001-4025. <https://doi.org/10.1007/s10902-022-00586-3>
- Lambert, N. M., Fincham, F. D., & Stillman, T. F. (2012) Gratitude and depressive symptoms: The role of positive reframing and positive emotion, *Cognition & Emotion*, 26:4, 615-633. <https://doi.org/10.1037/a0022575>
- Lau, R. W. L., & Cheng, S-T. (2011). Gratitude lessens death anxiety. *European Journal of Ageing*, 8, 169-175. <https://doi.org/10.1007/s10433-011-0195-3>
- Liu, S., Lithopoulos, A., Zhang, C. Q., Garcia-Barrera, M. A., & Rhodes, R. E. (2021). Personality and perceived stress during Covid-19 pandemic: Testing the mediating role of perceived threat and efficacy. *Personality and Individual Differences*, 168. <https://doi.org/10.1016/j.paid.2020.110351>
- Lyubomirsky, S., Dickerhoof, R., Boehm, J. K., & Sheldon, K. M. (2011). Becoming happier takes both a will and a proper way: An experimental longitudinal intervention to boost well-being. *Emotion*, 11(2), 391-402. <https://doi.org/10.1037/a0022575>
- McCullough, M. E., Emmons, R. A., & Tsang, J. (2002). The grateful disposition: A conceptual and empirical topography. *Journal of Personality and Social Psychology*, 82(1), 112-127. <https://doi.org/10.1037//0022-3514.82.1.112>

- McCullough, M. E., Kilpatrick, S. D., Emmons, R. A., & Larson, D. B. (2001). Is gratitude a moral affect? *Psychological Bulletin*, 127(2), 249–266. <https://doi.org/10.1037//0033-2909.127.2.249>
- McNeish, D. (2018). Thanks coefficient alpha, we'll take it from here. *Psychological Methods*, 23(3), 412–433. <https://doi.org/10.1037/met0000144>
- Otto, A. K., Szczeny, E. C., Soriano, E. C., Laurenceau, J.-P., & Siegel, S. D. (2016). Effects of a randomized gratitude intervention on death-related fear of recurrence in breast cancer survivors. *Health Psychology*, 35(12), 1320–1328. <https://doi.org/10.1037/hea0000400>
- Paredes, M. R., Apaolaza, V., Fernandez-Robin, C., Hartmann, P., & Yañez-Martinez, D. (2021). The impact of the Covid-19 pandemic on subjective mental well-being: The interplay of perceived threat, future anxiety and resilience. *Personality and Individual Differences*, 170. <https://doi.org/10.1016/j.paid.2020.110455>
- Peters, G.-J. Y. (2014). The alpha and the omega of scale reliability and validity: Why and how to abandon Cronbach's alpha and the route towards more comprehensive assessment of scale quality. *European Health Psychologist*, 16(2), 56-69. doi: 10.31234/osf.io/h47fv
- Schoemann, A. M., Boulton, A. J., & Short, S. D. (2017). Determining power and sample size for simple and complex mediation models. *Social Psychological and Personality Science*, 8(4), 379-386. <https://doi.org/10.1177/1948550617715068>
- Seligman, M. E. P., Steen, T. A., Park, N., & Peterson, C. (2005). Positive Psychology Progress: Empirical Validation of Interventions. *American Psychologist*, 60(5), 410–421. <https://doi.org/10.1037/0003-066X.60.5.410>
- Stephan, W. G., & Stephan, C. W. (2000). An integrated threat theory of prejudice. In S. Oskamp (Ed.), *Reducing Prejudice and Discrimination* (pp. 23-45). Lawrence Erlbaum Associates.
- Vindegaard, N., & Benros, M. E. (2020). COVID-19 pandemic and mental health consequences: Systematic review of the current evidence. *Brain, behavior, and immunity*, 89, 531-542. <https://doi.org/10.1016/j.bbi.2020.05.048>



- Wood, A.M., Froh, J.J. & Geraghty, A.W. (2010). Gratitude and well-being: a review and theoretical integration. *Clinical Psychology Review*, 30(7), 890-905. <https://doi.org/10.1016/j.cpr.2010.03.005>
- Xiong, J., Lipsitz, O., Nasri, F., Lui, L. M. W., Gill, H., Phan, L., Chen-Li, D., Iacobucci, M., Ho, R., Majeed, A., & McIntyre, R. S. (2020). Impact of COVID-19 pandemic on mental health in the general population: A systematic review. *Journal of Affective Disorders*, 277, 55–64. <https://doi.org/10.1016/j.jad.2020.08.001>
- Yüksel, A., & Oğuz-Duran, N. (2012). Turkish adaptation of the Gratitude Questionnaire. *Eğitim Arastirmaları-Eurasian Journal of Educational Research*, 46, 199-216.
- Zaleski, Z. (1996). Future anxiety: Concept measurement and preliminary research. *Personality and Individual Differences*, 21(2), 165–174. <https://doi.org/10.1177%2F0961463X16678257>
- Zaleski, Z., Sobol-Kwapinska, M., Przepiorka, A., & Meisner, M. (2019). Development and validation of the dark future scale, *Time & Society*, 28(1), 107-123. <https://doi.org/10.1177/0961463X16678257>
- URL-1. [https://schoemanna.shinyapps.io/mc\\_power\\_med/](https://schoemanna.shinyapps.io/mc_power_med/)
- URL-2. [https://osf.io/q8ydw/?view\\_only=0d191c7ecaad40c894469690a7022cca](https://osf.io/q8ydw/?view_only=0d191c7ecaad40c894469690a7022cca)

### Summary

During the severe waves of the Covid-19 outbreak in 2020, a critical question was how or by what means people could protect their mental well-being as uncertainties and fears about the future were mounting and face-to-face therapeutic support was severely limited due to pandemic containment measures. Low-cost and easy-to-use strategies are needed to help people improve their psychological well-being in such global crises. One strategy that fits this description is the gratitude listing intervention, i.e., listing things for which one is grateful for, which has been offered as a therapeutic tool to enhance mental well-being. (e.g., Emmons & Stern, 2013). However, Despite evidence of the usefulness of these types of interventions in promoting well-being (Emmons & Mishra, 2011), data on the effectiveness of these interventions in protecting against mental health problems before and during the pandemic appear to be weak. (e.g., Datu et al., 2021; Dennis & Ogden, 2022; Jans-Beken et al., 2020; Kloose et al., 2022).

The primary aim of this research was, therefore, to test the benefits of the gratitude listing during the Covid-19 outbreak. Specifically, we tested the effectiveness of this technique in reducing future anxiety (Zaleski, 1996) and perceived realistic and symbolic threats from Covid-19 (Kachanoff et al., 2020), all of which were intensely felt during the pandemic (Duplaga & Grysztar, 2021; Kachanoff et al., 2020; Liu et al., 2021; Paredes et al., 2021). Second, we compared the association of gratitude listing and disposition to gratitude (i.e., trait gratitude) with these outcomes, as they have been shown to be differentially related to the protection against psychological problems (Jans-Beken et al., 2020). Finally, we investigated the mediating role of perceived realistic and symbolic threats from Covid-19

to explore a possible mechanism linking gratitude and future anxiety, following the calls to explore mediators between gratitude and well-being (e.g., Wood et al., 2010).

In the first study ( $N = 405$ ; aged 18 to 66,  $M = 36.51$ ,  $SD = 12.04$ ), using a correlational design, participants rated the predictor and outcome measures. We predicted that disposition to gratitude would be associated with reduced perception of these threats and the decrease in them would be associated with a decrease in future anxiety. In the second study ( $N = 150$ ; undergraduate students; aged 18 to 38,  $M = 20.66$ ,  $SD = 2.55$ ), we used a pretest-posttest intervention design where participants were randomized to list grateful experiences or important daily life events every two days for a month, or to complete only the pretest and posttest measures. Participants in the gratitude condition were told that, every two days for a month (15 times in total), a form would be sent to their e-mails asking them to list five things they feel grateful for that had occurred in the past two days. For the daily life events condition, the task of listing gratitude-inducing experiences was replaced with the task of listing important daily life events. Our aim in this study was twofold. First, we examined the effect of gratitude listing on reduction of future anxiety and the threat perceptions. Second, we tested the same mediation model in the first study with gratitude intervention as the independent variable, hypothesizing that the participants in the gratitude listing condition would perceive less threats from Covid-19 than those in the control conditions, which in turn would lead them to feel less future anxiety.

Our results showed that disposition to gratitude and gratitude listing are differentially related to future anxiety under Covid-19 circumstances. In the first study, higher trait gratitude was associated with lower future anxiety, supporting previous work indicating that disposition to gratitude is negatively linked with and provides protection against mental problems, including anxiety (Jans-Beken et al., 2020; Lau & Cheng, 2011; Otto et al., 2016). In the second study, contrary to the literature suggesting that gratitude interventions function as a buffer against psychological problems (e.g., Emmons & Stern, 2013), gratitude listing practices did not reduce future anxiety. However, this result supports a growing body of evidence showing that the effect of gratitude interventions on anxiety reduction is weak (Cregg and Cheavens, 2020; Davis et al., 2016). One reason for the ineffectiveness of our gratitude intervention may be that our participants, due to the stressful Covid-19 situation, struggled to find genuine grateful experiences, which in turn severely impaired the positivity in their lives, a critical condition for gratitude interventions to be effective (Lambert et al., 2012). The inefficacy of the intervention is also attributable to the characteristics of our sample which consisted of relatively younger individuals with external rather than internal motivation, the two moderators that have been shown to weaken the utility of gratitude interventions (Dickens, 2017).

Regarding our mediation hypotheses, the results in both studies indicated that the perceived realistic and symbolic threats of Covid-19 did not significantly mediate gratitude-future anxiety relationship. In both studies, it seems that the non-significant indirect effects, at least statistically, are due to the weak correlations between gratitude and the perceived threats of Covid-19. Since both threats were strongly perceived in both studies, the weak gratitude-threat correlations are not attributable to the possibility that the participants regard these threats as unimportant. One reason may be that we collected the data when the pandemic was at its peak (summer and fall 2020). Therefore, the content of the threat items may have been a living reality rather than perceived threats for the participants. This, in turn, may have led them to feel helpless and to believe that the threats were beyond their control and independent of their dispositional characteristics or coping practices.

Overall, our research extended previous literature on the gratitude-well-being association to the Covid-19 pandemic context. Our results confirm previous work suggesting that trait gratitude can act as a buffer against mental problems, but gratitude interventions alone may not be sufficient to improve well-being without eliciting positivity in one's life. Finally, our findings provide empirical support for the view that caution should be exercised in using gratitude interventions as a substitute for psychotherapy.

## Appendices

### Appendix 1

#### Descriptive Statistics and Correlations among the Variables (Study 1)

**Table A1.**

***Means, Standard Deviations, and Correlations among the Variables***

Variables	1	2	3	<i>M</i>	<i>SD</i>
1 Trait Gratitude	-			3.39	0.84
2 Covid-19 Symbolic Threat	.09	-		3.06	1.06
3 Covid-19 Realistic Threat	.02	.43***	-	4.22	0.65
4 Future Anxiety	-.23***	.23***	.36***	2.79	0.85

\*\*\* $P < .001$

### Appendix 2

#### Instructions Given to the participants in the Gratitude and Daily Life Events Conditions (Study 2)

***Gratitude Condition:***

“We come across many things, both large and small, that we might be grateful or thankful for in our everyday lives. For instance, we might be grateful or thankful for such things as ‘waking up in the morning,’ ‘meeting someone interesting,’ ‘an exam that went well,’ ‘not being held up by red lights in traffic on our way home,’ ‘realizing that our family supports us,’ and ‘having a good time with friends.’ Please think over the last two days (today and the day before) and list on the space below five such things that you are grateful or thankful for at a length you wish.”

***Daily Life Events Condition:***

“We perform many activities or come across many events, both big and small, in our daily lives. For instance, we do many things like ‘going to classes,’ ‘go shopping,’ ‘cleaning out the shoe closet,’ ‘going to the park,’ ‘burning a meal we cook,’ and ‘watching a TV series.’ Please think over the last two days (today and the day before) and list on the space below five such events that you see as important at a length you wish.”

### Appendix 3

#### Exploratory Qualitative Analyses

***The Most Frequent Gratitude-Inducing and Daily Life Events Experiences***

We categorized participants’ responses written throughout the intervention based on the dominant theme in the responses. The responses were first categorized by the authors independently. Then, they were compared and decided upon.

Disagreements were resolved by discussion. Twelve themes emerged in the gratitude condition and 16 in the daily life events condition. We focused on the seven themes in the gratitude condition and five in the daily life condition that were mentioned by the majority of the participants (i.e. > 50%). These themes, their contents and sample responses are presented in Table A2.

**Table A2.**

***The Most Frequent Themes by Condition***

<b>Theme</b>	<b>f</b>	<b>N</b>	<b>Content &amp; Sample Responses</b>
<b>Gratitude Condition (n = 42)</b>			
Friends	257	37	Gratitude from chatting, meetings, activities with friends along with good feedback and news from them (“I met with my friends even for a few hours”).
Exams	227	35	Gratitude from exams that went well, assignment submissions, exam delays, and getting grades higher than expected (“Comprehensive study before my exams started”).
Health	225	34	Gratitude about the person’s, their families’, and friends’ healthy status and being non-infected with or overcoming the virus (“The fact that I am still alive”).
Eating-drinking	191	34	Gratitude from cooking, eating or drinking good stuff (“my trying a new recipe and its taste turning out to be good”).
Family	184	35	Gratitude from having a good time with the family, being lucky with regards to family (“My family’s love for me”).
Classes	154	37	Gratitude from studying, decreased work load and having a place to study (“My course load decreased”).
Downward SES Comparison	66	27	Gratitude from social comparisons with those whose social and economic conditions were worse off (“I am grateful that I have a roof over my head”).
<b>Daily Life Events Condition (n = 42)</b>			
Classes	305	39	Simple statements on attending classes and studying (“I studied until five in the morning”).
Eating-drinking	183	36	Statements on stuff cooked/baked, eaten and drunk (“I tried Asian cuisine”).
Exams	132	32	Statements about studying for the exams, assignment submissions, grades etc. (“I took the first online exam of this term”).
Friends	113	34	Statements about dates, meetings, talking, exchange of gifts with friends (“My friend and I took a walk last night after the exam”).

Watching TV series	103	30	Statements about watching TV series or movies at home (“I started watching a new series”).
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*Note.* *f* = frequency, *N* = number of participants responded to the themes in the leftmost column.

As can be seen from Table A2, participants in both conditions seem to have resorted to daily mundane activities, routines or duties (e.g., eating something, having a chat with friends, taking exams) for the fulfilment of the given tasks. Responses that involve complaints about the Covid-19 circumstances that have prevented from acting freely were prevalent. Unsurprisingly, many participants described their typical days as boring compared to the pre-Covid-19 times. As a result of these, the content of the themes in the gratitude condition suggest that participants might have had a hard time in finding grateful experiences to write about. For example, they generally tended to express their gratefulness compared to those who were worse off or in a manner that their current situation could have been worse. Thus, most of the grateful things in their lists can be described as lesser of two evils. These patterns of responses may explain the ineffectiveness of the gratitude intervention and hence the similarity between the gratitude condition and other conditions in terms of future anxiety and the Covid-19 threat perceptions scores.

### ***Thoughts and Feelings about the Intervention***

Using the same procedure as in the previous section, we categorized participants' thoughts and feelings about the intervention based on their responses to the posttest question, “What did you think or how did you feel about the listing tasks assigned to you? For example, how did you feel about writing? Were there any aspects of it that you liked or disliked? If so, what were they?” We identified four categories of feelings/thoughts in each of the conditions (Table A3).

**Table A3**

### ***The Most Common Thoughts and Feelings about the intervention***

<b>Themes of Feelings/Thoughts</b>	<b>N(%)</b>	<b>Content</b>
<b>Gratitude Condition (n = 36)</b>		
Feeling good	16(44)	Gratitude from being happy with what one has + feeling good when thinking/writing/realizing the things one
Having a hard time in finding something one is grateful for	12(33)	Statements about difficulties in finding things one is grateful for
Gaining awareness about the things one is grateful for	11(31)	Gratitude from realizing pleasant/gratitude-inducing things that had previously gone unrecognized
Realizing the negatives in one's life	5(14)	Statements about recognizing negative aspects of the life when trying to find a grateful experience.

**Daily Life Events Condition (n = 41)**

Having a hard time in finding important daily events	12(29)	Statements about difficulties in finding important events to write about because of monotonous daily routines
Realizing that the days go to waste	12(29)	Statements about how one realized that the days were passing on in a monotonous and wasteful manner when trying to find important daily events
Gaining awareness & questioning the life	10(24)	Statements about the awareness and questioning of the way they the time have been spent
Liking writing	8(20)	Statements about how participants liked writing about daily life events.

*Note.* N = number of participants indicating the corresponding themes of feelings/thoughts

In the gratitude condition, the proportion of participants in the four categories suggests that the gratitude listing created mixed effects on the participants. Three-quarters of the respondents indicated a positive attitude toward writing gratitude-inducing experiences, either reporting positive feelings or an increased awareness about the benefits of feeling grateful. But at the same time, nearly half of the participants reported that they were not comfortable with or did not benefit from the fulfillment of the task. Their negative mood seems to arise either from realizing that there is not much in their life to feel grateful for or realizing that the negatives in their life prevail the positives when trying to find something grateful. In the daily life events condition, the majority of the participants pointed out that they feel trapped in a monotonous routine or had difficulties in finding important daily things to list, which in turn made them think that their time is being wasted away. But some of the participants reported that they liked the task of listing daily experiences, which also helped them gain awareness about their typical day. Therefore, one can argue that the majority of the participants in both conditions were not able to derive the desired benefit from the intervention. One can also assert that the Covid-19 pandemic stripped the participants of many possible experiences they might have been grateful for or rendered life less colorful for them and made it more threatening because of the fears it gave way to.

**Changes Brought about by the Intervention**

Using the same procedure as in the previous sections, we content analyzed participants' responses to the post-test question, "Do you think that there has been a change in your perspective on life or events between the first day you started filling in the forms and today?" If so, do you think that this change was positive or negative?" Three main categories emerged out of the analysis: "positive change," "negative change", and "no change".

In the gratitude condition (n = 36), 56% reported a "positive change" (e.g., "I can say that there was a positive change. I am now more conscious of what I have"), 14% reported a "negative change" (e.g., "To be honest, I realized that I had a lot of stress in my life"), and 30% reported a "no change" response (e.g., "Even if my perspective on life and events had changed, I may not have realized it"). In the daily life events condition (n = 39), 36% reported a "positive change" (e.g., "I realized that I was enjoying my days"), 13% reported a "negative change" (e.g., "No, there was no

change. I am still an unhappy and depressed person”), and 51% reported a “*no change*” response (e.g., “I feel like nothing much has changed”). Overall, these results suggest that focusing on gratitude experiences yields a higher positive change than focusing on mere daily experiences. However, one should note that this difference is not substantial. The same holds true for the modest difference between the conditions with regard to the negative change and no change categories combined.